



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/656,166	09/08/2003	Mitsugu Sato	H6808.0023/P023	1328
24998	7590	07/27/2004	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			SMITH, JOHNNIE L	
2101 L STREET NW			ART UNIT	
WASHINGTON, DC 20037-1526			PAPER NUMBER	
			2881	

DATE MAILED: 07/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	<b>Application No.</b> 10/656,166	<b>Applicant(s)</b> SATO ET AL.	
	<b>Examiner</b> Johnnie L Smith II	<b>Art Unit</b> 2881	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 September 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1003</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-7 and 9-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over US patent 5,627,373 (Keese). In reference to claims 1-3 and 14, Keese teaches a charged particle beam apparatus and method comprising a charged particle source and a charged particle optical system for focusing a beam of

charged particles emitted by said charged particle source and scanning a sample with the focused beam (column 4 line 23- column 6 line 65).

4. Keese discloses a computer 40 for monitoring and controlling microscope. Computer 40 includes a user interface, a video circuit, and an imaging processing circuit that includes a pattern recognition circuit and a control circuit. Computer 40 is coupled to provide scan coil control signals SC1, SC2, SC3, and SC4 to scan coils 26 for synchronizing the scan pattern of the electron beam with a raster scan pattern on display a device. Computer 40 is coupled to provide control signals ASC, LC1, LC2, and OC in response to user-generated commands entered at user interface. Control circuit 50 generates control signals LC1 and LC2 for automatically correcting beam alignment, and generates control signal ASC for automatically correcting beam astigmatism.

5. Whereas applicant discloses an optical axis control means for controlling the incident point of the charged particle beam on at least two stages of focusing lenses including an objective lens, wherein the incident position of the charged particle beam is controlled by said optical axis control means such that an off-axis chromatic aberration produced by the objective lens and that produced by other lenses cancel each other out. It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate such means, since it is taught in

Keese, the utilization of computer 40 for automatically correcting beam alignment and correcting beam astigmatism by use of two focusing lenses and an objective lens.

6. In reference to claim 4, Keese discloses the charged particle beam apparatus wherein the charged particle beam is shone on the sample under observation at an angle with respect to the optical axis (figure 1).

7. In reference to claim 5, Keese discloses the charged particle beam apparatus having an astigmatism correction means (25), which is controlled, in accordance with the inclination angle of the charged particle beam (column 3 lines 16-46).

8. In reference to claim 6, Keese discloses the charged particle beam wherein the focal length of the objective lens is controlled in accordance with the inclination angle of the charged particle beam (column 6 lines 45-51).

9. In reference to claim 7, Keese teaches the charged particle beam apparatus wherein an irradiated position error of the charged particle beam on the sample is corrected in accordance with the inclination angle of the charged particle beam (column 2 line 57-column 3 line 15).

10. In reference to claims 9, Keese discloses all the base elements upon which this claim depend including the optical axis control means comprises an aperture (figure 1) but failed to clearly show the optical axis control means having a

transport mechanism for moving the aperture in a plane perpendicular to the optical axis. It would have been obvious to one of ordinary skill in that art at the time of the invention to incorporate a transport mechanism in the invention of Keese since it has been held that constructing a formerly integral structure in various elements involves only routine skill in art. One would have been motivated to make the elements separable for the purpose of focus control. *In re Dulberg*, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961).

11. In reference to claims 10-13, Keese shows a charged particle optical system for focusing a beam of charged particles emitted by said charged particle source and scanning a sample with the focused beam, having a deflector disposed between the charged particle beam source and at least two stages of focusing lenses including an objective lens for deflecting the charged particle beam; and wherein the charged particle beam is shone on the sample under observation at an angle with respect to the optical axis (figure 1).

12. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over US patent 5,627,373 (Keese) in view of US patent 5,373,158 (Murakoshi et al). Keese teaches the charged particle beam apparatus wherein the focusing lenses other than the objective lens include a first lens and a second lens wherein the first lens is excited when the charged particle beam is shone on the sample under observation

parallel to the optical axis (figure 1), and a control means (40) for controlling the signal capable of turning off the first lens, and the second lens is excited when the charged particle beam is shone on the sample at an angle with respect to the optical axis while turning off the first lens.

13. Keese failed to clearly show the first lens having magnetic poles with a relatively large opening diameter and gap and the second lens having magnetic poles with a relatively small opening diameter and gap, Murakoshi teaches having a lens system wherein symbols S1, S2 and S3 indicate the distances between the upper side magnet poles and the lower side magnet poles of the condenser lenses, 4, 5 and 6, and symbols D1, D2 and D3 indicate the average aperture diameters of upper side magnet poles and the lower side magnet poles. Murakoshi also teach the manipulation of sizes (column 5 line 53-column 6 line 6). It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Murakoshi with the apparatus of Keese, since Murakoshi teaches the adjusting of magnetic pole diameters for a desired focal length.

### ***Conclusion***

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US patents; 6,538,249 (Takane et al), 6,653,632 (Kazumori),

6,677,585 (Nomura), 4,393,310 (Hahn), 4,618,766 (van der Mast et al), 5,373,158 (Murakoshi et al), 6,740,877 (Sawahata et al), 5,512,747 (Maeda), 6,586,753 (Wada), and 5,221,844 (van der Mast et al). All of the cited US patents contain art similar to that being claimed by applicant, more specifically, charge particle beam apparatuses and method for.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Johnnie L Smith II whose telephone number is 571-272-2481. The examiner can normally be reached on Monday-Thursday 7-4 P.M. and Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 571-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.




Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



LSII

Johnnie L Smith II  
Examiner  
Art Unit 2881



JOHN R. LEE  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800